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| EXAMINER | |
|---|---|
| MAYES, MELVIN C | |
| **ART UNIT** | **PAPER NUMBER** |
| 1734 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/183,479 | LIBERATORE ET AL. | |
| | Examiner | Art Unit | |
| | Melvin Curtis Mayes | 1734 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *11/25/05*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Allowable Subject Matter*

(1)

The indicated allowability of claims 16 and 26 is withdrawn in view of the newly discovered reference(s) to WO 98/05045. Rejections based on the newly cited reference(s) follow.

### *Claim Objections*

(2)

Claims 12 and 22 are objected to because of the following informalities: "referenc" in line 10 should be "reference." Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

(3)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(4)

Claims 32 and 33 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for channels having a thickness of 25-50 microns, does not reasonably provide enablement for a channel having a width of 25-50 microns. The specification

does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

According to the specification, the channels can be embossed to a thickness range of 25-50 microns (pg. 9). The specification provides support for the channel having a thickness (depth) of 25-50 microns, not support channel width of 25-50 microns.

Claims 17-20 and 27-30 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for filling the channel with either conductive ink, resistor ink or capacitor ink, does not reasonably provide enablement for filling the channel with conductive ink then with either resistor ink or capacitor ink. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

According to the specification a channel is filled with either conductive, resistor or capacitor ink but there is no support for filling the channel with both conductive ink and then either resistor or capacitor ink.

(5)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(6)

Claims 12-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12 and 22 claim "embossing a channel directly on the surface..." Does "directly on the surface" refer to the position of the embossing tool or the channel, since according to the specification, the channel is embossed **in** or **into** the green tape, not **on** the green tape.

Claims 12 and 22 recite the limitation "the embossing tool" in line 4. There is insufficient antecedent basis for this limitation in the claim. While "embossing" implies the use of an embossing tool, it is suggested that antecedent basis be provided for "the embossing tool."

Claims 12 and 22 now claim screen printing with ink which has "a viscosity...low enough to improve, relative to the reference ink, ink flow within the channel." It is not clear from the specification what range of viscosities is "low enough" to improve ink flow. Is any viscosity lower than that of the reference ink (45 poise at 100 rad/s) low enough to improve ink flow or is there a range somewhere below 45 poise at 100 rad/s at which ink flow is improved? The specification only discloses two viscosities 45 poise at 100 rad/s for the standard ink (reference ink) and 30 poise at 100 rad/s for an embossing ink. The claims are not clear as to what viscosities are now encompassed.

Claims 16 and 26 claim "a viscosity of about 30 poise" and depend from Claims 12 and 22 which now claim screen printing an ink wherein the ink "has a viscosity, at screen printing temperature." Is the viscosity of about 30 poise the viscosity during screen printing? This is not clear because according to the specification, the ink in Table I has a viscosity of 30 poise at 100 rad/s. Is this viscosity also the viscosity of the ink during screen printing? It is not clear from the specification how this viscosity at 100 rad/s relates to the viscosity of the ink during screen printing.

The term "about" in claims 16 and 26 is a relative term which renders the claim indefinite. The term "about 30 poise" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The specification only discloses conventional viscosity of 45 poise (at a shear rate of 100 rad/s) versus present ink viscosity of 30 poise (at 100 rad/s). There are no other viscosity values recited that would allow one of ordinary skill in the art to determine what viscosity values are encompassed by "about 30 poise." It is suggested that the claims be limited to 30 poise since otherwise, the scope of the claim cannot be reasonably apprised.

It is also suggested that the claims referring the viscosity also state the shear rate since viscosity varies depending on the shear rate used to measure viscosity.

Claims 13 and 23 mention "tools" but there is only one tool mentioned in Claims 12 and 22.

Claims 17-20 and 27-30 claim filling the embossed channel with resistor or capacitor ink but depend from Claims 12 and 22 which now claim filling the embossed channel with

conductive ink. How is a channel filled with both conductive ink then able to be filled with resistor or capacitor ink? The specification describes filling a channel with either conductor, resistor, or capacitor ink but not with both conductive ink and resistor or capacitor ink.

Claim 22 has two steps of "covering the filled channel..." and is thus not clear.

***Claim Rejections - 35 USC § 103***

(7)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(8)

Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 8-264364 in view of Amendola et al. 4,546,065, JP 3-219605 Abstract and WO 98/05045.

JP 8-264364 discloses a method of making an inductance component comprising: compressing a green sheet insulator layer 3 with a convex metal mold 10 to form a recess having a coil pattern in the green sheet; printing conductive paste into the recess to form a conductor; laminating a number of layers; and baking (firing) (Abstract and computer translation [0015]). JP '364 does not specifically disclose using heat while compressing the green sheet with the metal mold or the viscosity of the conductive paste.

Amendola et al. teach that in embossing indentations into a ceramic green sheet by pressing a die against the surface of the greensheet, embossing conditions involve heating the greensheet to a temperature at which the binder in the greensheet flows and can be shaped under

temperature such as 75° to about 95°C (167-203°F) and pressure of 500 to 3000 psi (col. 7, lines 3-33).

JP 3-219605 Abstract (JP '605) teaches that a recessed part formed in a green sheet is printed with conductor paste by screen-printing for forming a laminated inductance element.

WO 98/05045 (WO '045) teaches that conductor paste printing on green sheets and co-firing comprises a conductor paste such as of silver powder adjusted to a viscosity of about 300 to 30,000 centipoise (3-300 poise) (pgs. 5 and 10 – see corresponding US 6,120,884, col. 4, lines 1-9, Example 1).

It would have been obvious to one of ordinary skill in the art to have modified the method of JP '364 for making an inductance component by forming the recess coil pattern in the green sheet by compressing with the metal mold at temperature in the range of 75° to about 95°C (167-203°F) and pressure of 500 to 3000 psi, within or encompassing temperatures and pressures as claimed in Claims 13 and 14, as taught by Amendola et al., as temperature and pressure at which is green sheet is embossed by a die so that the binder in the greensheet flows and can be shaped under pressure. Using screen printing to print the conductive paste in the recess would have been obvious to one of ordinary skill in the art, as JP '605 teaches that a recess formed in a green sheet for forming an inductance element is printed with conductor paste by screen-printing.

It would have been obvious to one of ordinary skill in the art to have further modified the method of JP '364 by screen printing conductive paste such as of silver having a viscosity in the range of about 300 to 30,000 centipoise (3-300 poise) (which encompasses 30 poise as claimed in Claim 16), as taught by WO '045 as the viscosity of paste with can be printed on green sheets for co-firing. By screen printing paste having viscosity in the range of 3-300 poise, WO '045

obviously suggests screen printing ink having a viscosity less than the claimed reference ink which as a viscosity of 45 poise at 100 rad/s and a viscosity with improved ink flow relative to the claimed reference ink.

(9)

Claims 12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974) in view of Schmeckenbecher 3,948,706 and WO 98/05045.

IBM Technical Disclosure Bulletin (April 1974) discloses a method of screen printing on indented green sheets to form a multilayer ceramic module having screen-printed lines of increased conductivity comprising: pressing indentations of desired conductor patterns into the PVA coated side of a green sheet by hot stamping using an embossed metal plate under temperature and pressure; filling the indentation by screen printing by squeegeeing conductive paste of metal powder such as silver and organic vehicle into the indentations; stacking green sheets; and co-firing.

Schmeckenbecher teaches that when metallizing a green sheet using polyvinyl alcohol film on the green sheet as a mask material, the polyvinyl alcohol (PVA) mask material and green sheet are thermally machined, stamped or cut to form the recessed lines in the green sheet. As shown in the figures and suggested, the PVA is only on the surface of the green sheet to form a mask for applying paste to the recess and the paste is non-solvent to the PVA and the PVA is non-wettable to the paste (Figure, col. 2-3).

WO 98/05045 (WO '045) teaches that conductor paste printing on green sheets and co-firing comprises a conductor paste adjusted to a viscosity of about 300 to 30,000 centipoise (3-300 poise) (pgs. 5 and 10 – see corresponding US 6,120,884, col. 4, lines 1-9, Example 1).

It would have been obvious to one of ordinary skill in the art to have screen printed the paste directly into the greens sheet using the PVA on the green sheet as a mask for screen printing in the method of IBM Technical Disclosure Bulletin (April 1974), as Schmeckenbecher teaches that when metallizing a green sheet using PVA film on the green sheet as a mask material, after the (PVA) film and green sheet are thermally machined, stamped or cut to form the recessed lines in the green sheet, the PVA is only present as a mask on the surface of the green sheet. Stamping such that the PVA is only on the surface and the paste can be filled directly into the indentation in the green sheet would have been obvious to one of ordinary skill in the art because Schmeckenbecher teaches that when using PVA as a mask, the paste is non-solvent to the PVA and the PVA is non-wettable to the paste and it would have been obvious to one of ordinary skill in the art that PVA cannot be present in the indentation to be filled since The PVA is non-wettable to the paste while the paste is non-solvent to the PVA, thus PVA in the indentation would also function as a mask prevent filling of the indentation with paste.

By hot stamping with the embossed metal plate, the indentations (channel) are obviously embossed directly on the surface of a green tape using heat and pressure to transfer the pattern from an embossing tool, as claimed, as opposed to embossing indirectly on the green tape using some other member or intermediate step to emboss the channel.

It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) by screen printing conductive paste

having a viscosity in the range of about 300 to 30,000 centipoise (3-300 poise) (which encompasses 30 poise as claimed in Claim 16), as taught by WO '045 as the viscosity of paste with can be printed on green sheets for co-firing. By screen printing paste having viscosity in the range of 3-300 poise, WO '045 obviously suggests screen printing ink having a viscosity less than the claimed reference ink which as a viscosity of 45 poise at 100 rad/s and a viscosity with improved ink flow relative to the claimed reference ink.

(10)

Claims 22, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974) in view of Schmeckenbecher 3,948,706, WO 98/05045 and Prabhu 5,277,724.

IBM Technical Disclosure Bulletin (April 1974) discloses a method of screen printing on indented green sheets to form a multilayer ceramic module having screen-printed lines of increased conductivity comprising: pressing indentations of desired conductor patterns into the PVA coated side of a green sheet by hot stamping using an embossed metal plate under temperature and pressure; filling the indentation by screen printing by squeegeeing conductive paste of metal powder and organic vehicle into the indentations; stacking and laminating green sheets; and co-firing. IBM Technical Disclosure Bulletin (April 1974) does not disclose laminating the green sheets onto a metal support coated with a low melt temperature glass.

Schmeckenbecher teaches that when metallizing a green sheet using polyvinyl alcohol film on the green sheet as a mask material, the polyvinyl alcohol (PVA) mask material and green sheet are thermally machined, stamped or cut to form the recessed lines in the green sheet. As shown in the figures and suggested, the PVA is only on the surface of the green sheet to form a

mask for applying paste to the recess and the paste is non-solvent to the PVA and the PVA is non-wettable to the paste (Figure, col. 2-3).

WO 98/05045 (WO '045) teaches that conductor paste printing on green sheets and co-firing comprises a conductor paste adjusted to a viscosity of about 300 to 30,000 centipoise (3-300 poise) (pgs. 5 and 10 – see corresponding US 6,120,884, col. 4, lines 1-9, Example 1).

Prabhu teaches that multi-layered, co-fired ceramic on a metal base is formed by utilizing a bonding layer of low softening point glass and co-firing to bond the ceramic to the metal base. The bonding layer of glass provides a means of attaching the multi-layered ceramic to the base and minimizes shrinkage of the ceramic during the firing (col. 1, line 55 - col. 2, line 48).

It would have been obvious to one of ordinary skill in the art to have screen printed the paste directly into the greens sheet using the PVA on the green sheet as a mask for screen printing in the method of IBM Technical Disclosure Bulletin (April 1974), as Schmeckenbecher teaches that when metallizing a green sheet using PVA film on the green sheet as a mask material, after the (PVA) film and green sheet are thermally machined, stamped or cut to form the recessed lines in the green sheet, the PVA is only present as a mask on the surface of the green sheet. Stamping such that the PVA is only on the surface and the paste can be filled directly into the indentation in the green sheet would have been obvious to one of ordinary skill in the art because Schmeckenbecher teaches that when using PVA as a mask, the paste is non-solvent to the PVA and the PVA is non-wettable to the paste and it would have been obvious to one of ordinary skill in the art that PVA cannot be present in the indentation to be filled since The PVA is non-wettable to the paste while the paste is non-solvent to the PVA, thus PVA in the indentation would also function as a mask prevent filling of the indentation with paste.

By hot stamping with the embossed metal plate, the indentations (channel) are obviously embossed directly on the surface of a green tape using heat and pressure to transfer the pattern from an embossing tool, as claimed, as opposed to embossing indirectly on the green tape using some other member or intermediate step to emboss the channel.

It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) by screen printing conductive paste having a viscosity in the range of about 300 to 30,000 centipoise (3-300 poise) (which encompasses 30 poise as claimed in Claim 16), as taught by WO '045 as the viscosity of paste with can be printed on green sheets for co-firing. By screen printing paste having viscosity in the range of 3-300 poise, WO '045 obviously suggests screen printing ink having a viscosity less than the claimed reference ink which as a viscosity of 45 poise at 100 rad/s and a viscosity with improved ink flow relative to the claimed reference ink.

It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) for making a multilayer ceramic module by co-firing the laminated green sheets on a metal base using a low melting bonding layer of glass, as taught by Prabhu, for attaching a multi-layered ceramic to a base and minimize shrinkage of the ceramic during firing.

(11)

Claims 13, 14, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 12 or 22 in paragraphs (9) or (10), and further in view of Amendola et al. 4,546,065.

Amendola et al. teach that in embossing indentations into a ceramic green sheet by pressing a die against the surface of the greensheet, embossing conditions involve heating the greensheet to a temperature at which the binder in the greensheet flows and can be shaped under pressure such as 75° to about 95°C (167-203°F) and pressure of 500 to 3000 psi (col. 7, lines 3-33).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined by hot stamping the indentations in the green sheet under pressure and temperature in the ranges of 75° to about 95°C (167-203°F) and 500 to 3000 psi, as taught by Amendola et al. as temperatures and pressures suitable for embossing indentations in a green sheet. Hot stamping (embossing) at temperatures and pressures within the ranges as claimed in Claims 13, 14, 23 and 24 would have been obvious to one of ordinary skill in the art, as taught by Amendola et al.

(12)

Claims 17, 18, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 12 or 22 in paragraphs (9) or (10), and further in view of Vitriol et al. 5,028,473.

Vitriol et al. teach that in a multi-layer co-fired ceramic, electrical circuit patterns on the green sheets include not only metallization but may further include resistors, capacitors,

inductors and other electrical components compatible with the process, the patterns formed on the sheets by screening or any other suitable method (col. 4, lines 57-63).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined for making a multilayer ceramic module by also screen printing resistors or capacitors in indentations in the green sheet, as taught by Vitriol et al., as also screened on green sheets for making a multi-layer, co-fired ceramic laminate. Screen printing the green sheet with conductive paste and resistor paste or capacitor paste would have been obvious to one of ordinary skill in the art as Vitriol et al. teach that in a multi-layer co-fired ceramic, these electrical components may also be included by screen printing.

(13)

Claims 19, 20, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 18 or 28 in paragraph (12), and further in view of either Hernandez 5,272,590 or Tormey et al. 5,953,203.

Hernandez teaches that a dielectric layer for a capacitor can be printed of dielectric paste which include barium titanate, lead magnesium niobate or strontium titanate (col. 8, lines 45-50).

Tormey et al. teach that a multilayer ceramic board is provided with embedded capacitors by screen printing capacitor ink of barium titanate or lead magnesium niobate (col. 2-7)

It would have been obvious to one of ordinary skill in the art to have screen printed capacitors in indentations in the green sheet using a paste of either barium titanate or lead magnesium niobate, as taught by Hernandez, as dielectric materials used in paste for printing a dielectric layer for a capacitor, or as taught by Tormey et al., as capacitor ink screen printed to provide a multilayer ceramic board with embedded capacitors.

(14)

Claims 21 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 12 or 22 in paragraphs (9) or (10), and further in view of Hayama et al. 5,609,704.

Hayama et al. teach that when filling a groove with conductive paste, the volume of the paste filling the groove is reduced by an amount corresponding to the evaporated organic solvent and teaches that the filling is repeated to fill up the reduced amount so that the thickness of the paste can be set at the same value at the depth of the groove (col. 8, lines 16-27).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined for making a multilayer ceramic module by repeating the step of screen printing the paste in the indentations, as taught by Hayama et al., to set the thickness of the paste in the indentation to the same value as the depth of the indentation, as paste upon drying reduces in volume by an amount corresponding to the evaporated organic solvent.

(15)

Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 12 or 22 in paragraphs (9) or (10), and further in view of Carroll et al. 5,162,062 and Hampden-Smith et al. 6,689,186

Carroll et al. teach that finer line spacing is necessary in the drive for miniaturization of multilayer electronic circuits (col. 1, lines 10-27).

Hampden-Smith et al. teach that thick film conductive lines for modules can be made of width smaller than about 50 microns with line pitch smaller than 100 microns (col. 56, line 64 – col. 57, line 7).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined by embossing to form lines having width of smaller than 50 microns, as Carroll et al. teach that finer line spacing is necessary in the drive for miniaturization of multilayer electronic circuits and Hampden-Smith et al. teach that thick film conductive lines for modules can be made of width smaller than about 50 microns with line pitch smaller than 100 microns.

***Response to Arguments***

(16)

Applicant's arguments filed November 25, 2005 have been fully considered but they are not persuasive.

Applicant argues that in JP 8-264364, the method of molding channels is one hypothetical method among many and screen printing is not taught and argues that Amendola fills the channels after firing and cannot make obvious a process that does not densify prior to filling the channel.

Applicant argues that an essential feature of IBM TDB is coating the green sheet with PVA which does not make obvious a process that does not use PVA or its like in that the current claims exclude the step of applying ink to a coating such as PVA because the channel is directly embossed on the surface of the a green tape.

(17)

With respect to the rejection based on JP 8-264364, the method of using a metal mold to form a recess in a green sheet, printing conductive paste into the recess to form a conductor, laminating green sheets such that the conductor is between green sheets and then firing is clearly disclosed, although one of many methods disclosed, and is not merely hypothetical. As taught by JP 3-219605 Abstract now cited, printing paste in a recess by screen-printing is known. While Amendola fills channel after firing in its particular method, the pertinent teaching of the reference is to emboss a green sheet under temperature such as 75° to about 95°C (167-203°F) and pressure of 500 to 3000 psi. These embossing parameters are pertinent whether or not the green sheet is filled before firing, as in JP '364, or after firing as in the particular method of Amendola for surface conductive pattern.

With respect to the rejection based on IBM TDB, although the green sheet surface is coated with PVA, the method includes embossing a channel directly on the surface of the green sheet using an embossing tool because an embossed metal plate itself is used to emboss the green sheet using heat and pressure.

***Conclusion***

(18)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
February 13, 2006